MARSHALL STAR
Marshall Space Flight Center
Aug. 24, 2000
'We bring people to space — We bring space to people'

X-ray observatory marks first anniversary

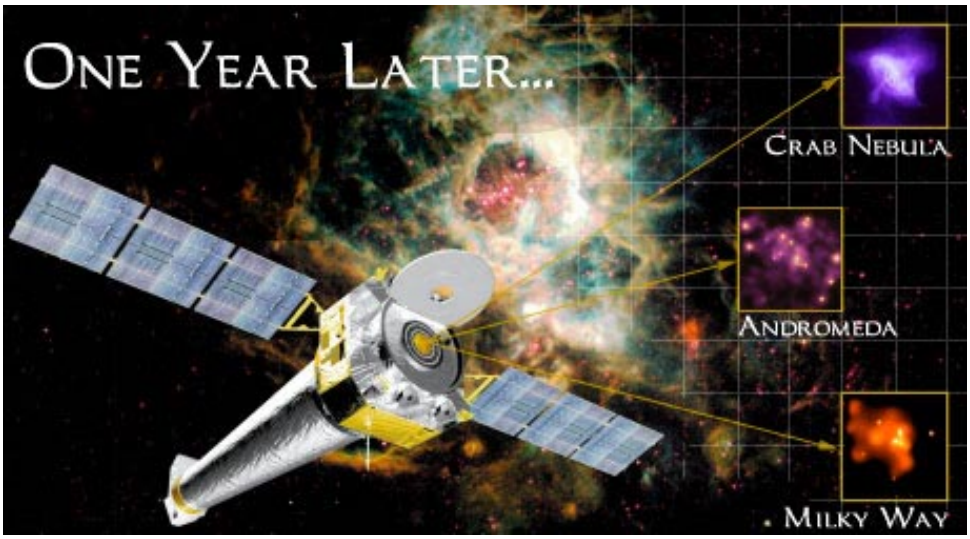
Chandra 'changes way we look at the universe'

by Marianne Higgins

NASA's Chandra X-ray Observatory — managed by the Marshall Center — is marking its first year in orbit with an impressive list of astronomy "firsts."

Through Chandra's images, humans witnessed for the first time the full impact of a blast wave from an exploding star, a flare from a brown dwarf — or failed — star, and a small galaxy in the process of being cannibalized by a larger galaxy.

"Our goal is to identify never-before-seen phenomena, whether it's new or millions of years old. All this leads to a better understanding of our universe," said Martin Weisskopf, chief project scientist for the Chandra program. "Indeed, Chandra has changed the way we look at the universe."



Chandra was launched in July 1999 and recorded its first images in mid-August 1999. After only two months in space, the observatory revealed a brilliant ring around the heart of the Crab Pulsar in the Crab Nebula — the remains of a stellar explosion — providing clues about how the nebula is energized by a pulsing neutron, or collapsed, star.

Chandra also detected a faint X-ray source in the Milky Way galaxy, which may be the long-sought X-ray emission from the known massive black hole at the center. A black hole is a region of space with so much mass concentrated in it there is no way for a nearby object — even light — to escape its gravitational pull.

The observatory captured an image that revealed gas funneling into a supermassive black hole in the heart of the Andromeda galaxy is much cooler than expected. Andromeda is the Milky Way's nearest galaxy neighbor at 2 million light years away. Recently, Chandra discovered the first X-ray flare ever seen from a brown dwarf.

"Chandra is teaching us to expect the unexpected about all sorts of objects ranging from comets in our solar system and relatively nearby brown dwarfs to distant black holes billions of light years away," said Harvey Tananbaum, director of the Chandra X-ray Center in Cambridge, Mass.

Perhaps one of Chandra's greatest contributions to X-ray astronomy to date is the resolution of the X-ray background — a glow throughout the universe whose source or sources are unknown. Astronomers are now pinpointing the various sources of the X-ray glow because Chandra — compared to previous X-ray telescopes — has eight-times greater resolution and is able to detect sources more than 20-times fainter.

Chandra's "firsts" began before the telescope left Earth. "The Chandra team had to develop technologies and processes never tried before," said Tony Lavoie, Chandra program manager at Marshall. "One example is that we built and validated a measurement system to make sure the huge cylindrical mirrors of the telescope were ground correctly and polished to the right shape."

The polishing effort resulted in an ultra-smooth surface for all eight of Chandra's mirrors. As an analogy, if the state of Colorado were as smooth as the surface of Chandra's mirrors, Pike's Peak would be less than an inch tall. As a result, Chandra has such precision resolution, it's like someone reading the letters of a stop sign 12 miles away.

"Chandra has experienced a great first year of discovery and we look forward to many more tantalizing science results as the mission continues," said Alan Bunner, program director, Structure and Evolution of the Universe at NASA Headquarters in

*See **Chandra** on page 11*

"Safety RULES"
— Safety slogan submitted by Chuck Burgess, CMT

Center Director announces plan to help local students launch reusable rockets with science payloads

by Marianne Higgins

The Marshall Center is launching a new education initiative — to help area high school and college students successfully build and launch reusable rockets carrying an actual science payload.

The initiative, announced at last week's all-hands meeting by Center Director Art Stephenson, is still in the development stage. The goal is to get students in high schools and both two- and four-year colleges in the community excited about and involved in science, math and engineering.

"As NASA's lead center for space transportation and microgravity science, it makes sense for the Marshall Center to get our community involved in the excitement of launching space vehicles with microgravity science payloads. Government and Industry must make a strong effort to develop our work force of tomorrow," said Stephenson.

"Conversations with local educators tell me this is the type of hands-on experience our students want."

"Projects like this offer the students an opportunity of a lifetime," said Ray Swaim, superintendent of Madison County schools. "Partnerships such as this continue to prove daily that working together enhances our success for a greater tomorrow. We are excited and thrilled to play a role in this endeavor."

Stephenson envisions rockets built and launched by local university, college and high school students with support from NASA, NASA alumni and Industry.

NASA's future leaders will be mentored by its current and past work force. Efforts are under way to solicit volunteer help from current and retired NASA employees to assist the students and to help ensure the success of the program. NASA Marshall's alumni president, Ed Buckbee, said the alumni wholeheartedly support such an undertaking.

Plans are for a single public high school in Huntsville, Madison or Madison County to be competitively selected to lead the design, construction and launch of a reusable launch vehicle. A second high school will be competitively selected to lead the design and construction of a microgravity science payload.

The University of Alabama in Huntsville (UAH) will lead the design, construction and launch of the university/college reusable launch vehicle. Alabama A&M University will lead the design and construction of the university microgravity science payload.

"This initiative by Art Stephenson and the Marshall Center is a tremendous idea to create special excitement in science and engineering education for high school and college students," said UAH President Frank Franz.

"It has been our experience that students become more involved and learn more through hands-on instruction," Franz said. "UAH faculty and students have extensive experience in hands-on teaching, as well as the development and launching of sub-orbital rockets. We applaud Mr. Stephenson's idea and look forward to continuing our involvement in this type of project."

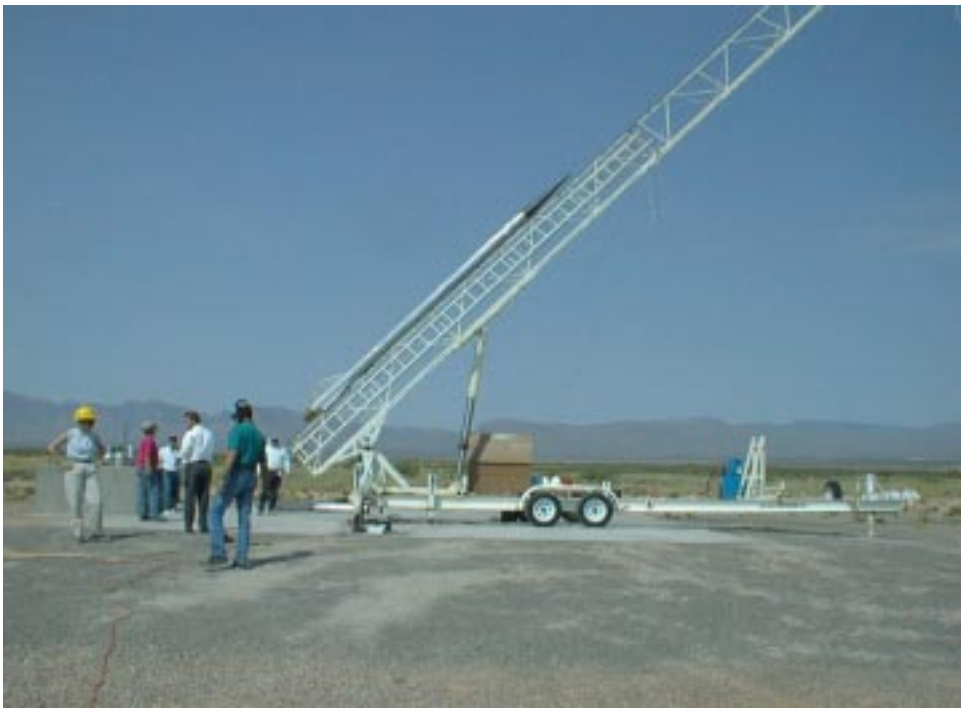
"This is the exact form of collaboration that postures our students for success in the vast science arena," commented Alabama A&M President John T. Gibson. "While our relationship with NASA is extensive, this venture takes our partnership to new frontiers."

Details will be announced later on the program content and eligibility requirements.

"This project directly addresses a concern I have about where Marshall's future work force will come from," said Stephenson. "Energizing youth right here in Alabama about NASA's launch and microgravity science missions can help prepare them to take over the leadership of future space programs."

The Marshall Center provided assistance to students at Fredericksburg High School in Fredericksburg, Texas, who successfully launched a 22-foot rocket earlier this month. It achieved an altitude of 35,000 feet.

The writer, employed by ASRI, supports the Media Relations Department.



Courtesy photo

High school students in Fredericksburg, Texas, prepare to launch their rocket.

ISO 9000 Surveillance Audit set Aug. 30-31

National Quality Assurance will conduct a two-day ISO surveillance audit next week. Two auditors will validate the continued registration to the present scope of Marshall's flight-related activities.

The schedule for the audit is:

- Aug. 30 – 9 a.m., entrance meeting in Bldg. 4203, room 1201
- Aug. 30 – 3:30 p.m., daily exit meeting in Bldg. 4203, room 1201
- Aug. 31 – 8 a.m., resume audit
- Aug. 31 – 11:30 a.m., exit meeting in Bldg. 4203, room 1201

The ISO Elements of emphasis that will be reviewed are:

- Element 1 – Management Responsibility
- Element 2 – Quality System
- Element 4 – Design Control
- Element 8 – Product Identification and Traceability - NEW
- Element 9 – Process Control - NEW
- Element 14 – Corrective and Preventative Action
- Element 17 – Internal Quality Audits
- Element 20 – Statistical Techniques - NEW
- Customer Complaints and Use of the National Quality Assurance logo

Remember: "Audit Preparation Questions and Answers" as well as "21 Pictures to being better prepared for Audits" are located at the top of the ISO 9000 Web site. Please visit these topics to refresh your knowledge for the upcoming surveillance.

Lockheed Martin hosts Native American procurement conference

Fifty-two attendees representing 35 Native American businesses from around the country recently participated in a procurement conference sponsored by Lockheed Martin Space Systems Company-Michoud Operations in New Orleans, La.

The conference — an effort to expand Lockheed Martin's supplier base — is believed to be the first of its kind in support of the NASA Space Shuttle program. All 35 firms were added to Lockheed's bid list.

Lockheed Martin designs and assembles the external propellant tank, the only non-reusable major Shuttle component.

Suppliers met with buyers to learn how Lockheed Martin's purchasing system works, and about the products and services the corporation buys. The businesses represented included industries such as metal works, tooling and manufacturing operations.

"These conferences are a real benefit because it gets the information back to people like myself and those who go back to their tribes," said Pat Arnold, deputy director of the Louisiana governor's Office of Indian Affairs, and a member of the Houma tribe.

Upcoming Events

New Employee Orientation — A New Employee Orientation will be Sept. 18-20 at Sci-Quest on Wynn Drive for all new Marshall employees hired during the summer months. All employees scheduled to attend will receive an official letter requesting their attendance prior to the orientation.

Amnesty Day — The Marshall Center will hold Amnesty Day from 9 a.m.-2 p.m. Sept. 7 on the north side of Bldg. 4481. Employees are encouraged to turn in hazardous chemicals with expired shelf-life and unneeded and unclaimed chemicals.

Deaf Awareness Day — Deaf Awareness Day will be from 10 a.m.-3 p.m. Sept. 30 at Madison Square Mall. Come and enjoy activities while you explore the world of the deaf community. Events include Kathleen Ryan Peavy, Miss Deaf Alabama; entertainment; children's poster contest; exhibits and awards.

AMPET Conference — The 4th Conference on Aerospace Materials, Processes and Environmental Technology (AMPET) will be Sept. 18-20 at the Von Braun Center in Huntsville. All Marshall employees are invited. To attend, civil servants should submit a Conference Form 1265 to CD20/Stephanie J. Elliot no later than Sept. 1. A blanket conference form can be submitted from each directorate or an individual form can be submitted. Contractors should register to attend on the Web site. Cost for contractors to attend the conference is $345. Additional conference information can be found at the Conference Web site at: http://ampet.msfc.nasa.gov.
For more information, call Elliott at 544-7553.

Women's Equality Day — The annual Women's Equality Day program will be at 10 a.m. Monday in the Bob Jones Auditorium in the Sparkman Center on Redstone Arsenal. Marshall employees Dr. Jan Davis, deputy director of the Flight Projects Directorate; May Wales, ombudsman in the Center Operations Directorate; and Beth Partain, executive support assistant in the Office of the Director, will be honored for their career accomplishments. Everyone is invited.

Huntsville Simulation Conference — The Huntsville Simulation Conference 2000 will be Oct. 4-5 at the Holiday Inn at Research Park in Huntsville. For more information or to register to attend the conference, call Joseph S. Gauthier at 922-0802 or visit the Web at: http://www.scs.org

Marshall Center to implement first two projects of NASA's Integrated Financial Management Program

by Kathey Nabors

Beginning in September, the Marshall Center will be implementing the first of two new projects designed to improve business practices NASA-wide.

The projects are part of the NASA-managed Integrated Financial Management Program.

Marshall's Office of the Chief Financial Officer recently celebrated the efforts of the Core Financial and Integration Projects with a program and open house.

Lee Milteer, motivational speaker and trainer, gave a presentation on successful teams.

Marshall Center Chief Financial Officer Dave Bates thanked everyone for their work for the program. Bates also helped to prepare the group for the challenges the recently restructured program will bring.

Photo by Terry Leibold, NASA/Marshall Space Flight Center

Bates, right, speaks to employees whose work helped restructure business practices that will be implemented NASA-wide.

The Integrated Financial Management Program's mission is to improve the financial, physical and human resources management processes throughout NASA. Headed by Mike Mann, the newly appointed director of the Integrated Financial Management Program, it will reengineer NASA's business infrastructure in the context of industry "best practice." The program also will implement enabling technology to provide necessary management information to support NASA's strategic implementation plan.

When he became the director of the program this past spring, Mann began a restructuring of the program, designed to reduce risk, increase likelihood of success, apply guiding principles based on best practices and maximize short-term benefits. The restructured program will have an approved Program Commitment Agreement in place in mid-September.

The Core Financial Project and the Integration Project — being developed and implemented at Marshall — are the first of several projects planned as part of the new NASA-managed program.

The Core Financial Project Office will acquire and implement — first at Marshall and then at all NASA Centers — a commercial, off-the-shelf core financial software package. Marshall will be the pilot implementation site. This activity begins in March 2001 and is expected to conclude 12 to 18 months later.

As a part of this effort, NASA's business practices will be reengineered to align them with the software functionality. The new system and processes will replace the various core financial systems and processes currently used by NASA's Centers. The result will be standard core financial software and standard business practices for the Agency.

Among the missions of the Integration Project are definition, implementation and maintenance of the business and applications architecture, as well as the technical infrastructure on which the applications architecture operates. This includes providing a repository for the NASA business processes and data.

The Integration Project will acquire the hardware and software, and develop the infrastructure for the Core Financial Project and the other projects that will follow. The Integration Project will deploy the elements of the architecture, test this new infrastructure and be responsible for operations upon successful completion of the implementation.

The new integrated financial management system will be designed with an eye toward the future. The system will improve customer information and data interoperability capabilities to enable a shift to e-business. It will improve the efficiency of the processes allowing NASA to "do more with less."

The Integrated Financial Management Program will enable NASA to operate more effectively by eliminating the need for multiple sets of books and providing a greater understanding of program costs.

The writer is the change management lead in the Integrated Financial Management Core Financial Project Office.

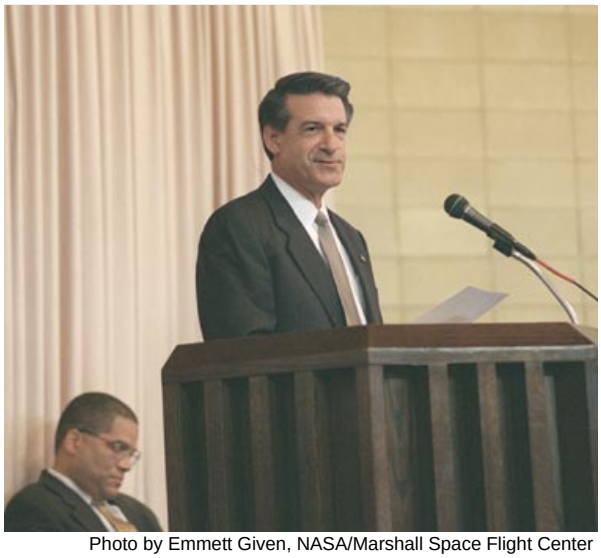
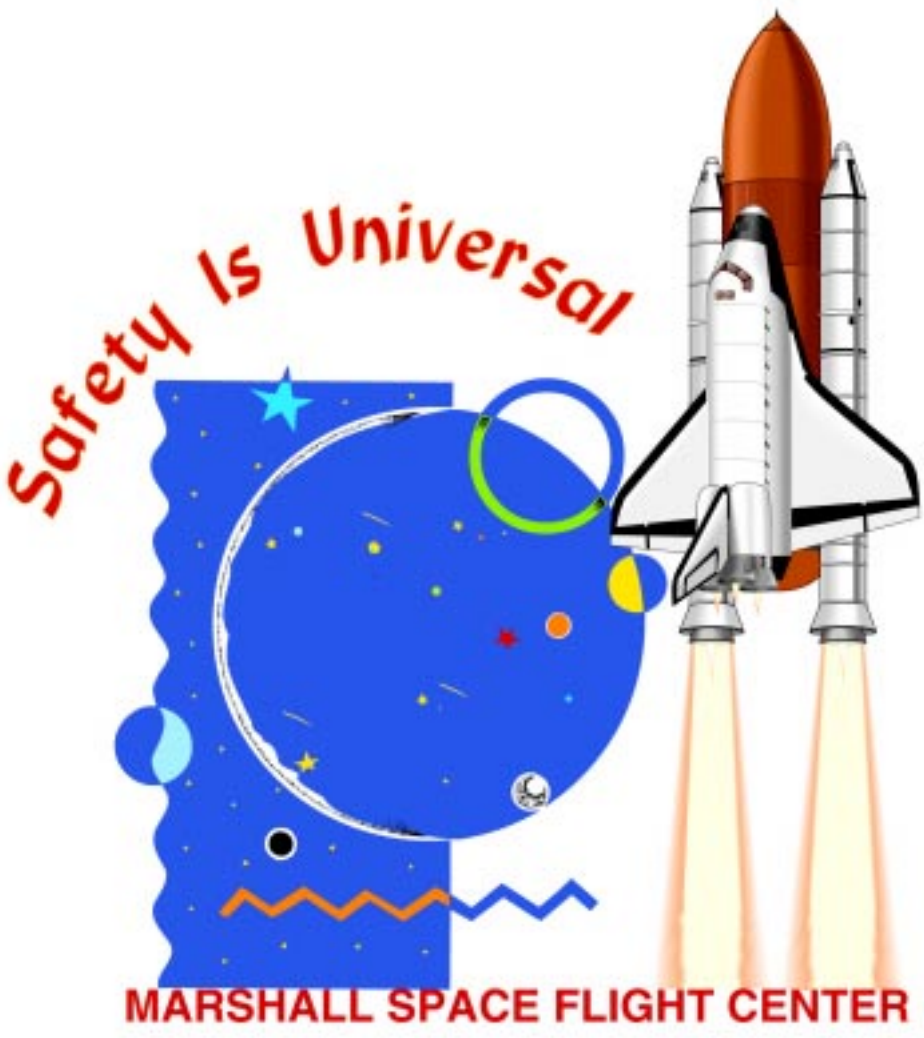


Photo by Emmett Given, NASA/Marshall Space Flight Center

Center Director speaks to Oakwood College

Center Director Art Stephenson, right, addressed the Oakwood College Colloquium on Aug. 11. He provided an overview of Marshall's programs and projects and thanked the Oakwood faculty for supporting the foundation of the Center's mission by developing exceptional math, science and engineering students. At left is Oakwood College President Dr. Delbert Baker.

Safety Day is Oct. 25



Safety Day slogan winner is Richard Leonard of the Reusable Solid Rocket Motor Office for his submission, "Safety is Universal." Maureen Hunt of United Space Alliance also won for her graphic.

Safety Bowl Sweet 16 kicks off Wed.

Competition begins Wednesday in Marshall's Safety Bowl. Teams meeting in the Sweet 16 round being held in Morris Auditorium are:

• Procurement Office vs. Science Directorate, Team A at 10 a.m.

• Chief Counsel's Marshall Law vs. Science Directorate, Team B at 10:30 a.m.

• Center Operations Directorate vs. Flight Projects Directorate, Team A at 2 p.m.

• Equal Opportunity Equalizers vs. Flight Projects Directorate, Team B at 2:30 p.m.

Come on out and support your team.

Dinner honors retirees, celebrates Marshall's 40th anniversary

More than 600 employees attended the annual retiree dinner Aug. 17 held to honor the 238 Marshall retirees from 1999, while celebrating Marshall's history. Following the dinner, employees performed skits.

Photos by Doug Stoffer, NASA/Marshall Space Flight Center

Above, Marshall retirees, employees, contractors and family members gathered to honor last year's retirees. Left, Norm Brown the "rock star" performs "All My Retired Friends Are Coming Over Tonight," as fans rush the stage.

From left, Dustin Williams, Fred Davy, David Reynolds and Dale Thomas perform "Ain't Nothin' Like a Dame."

Center Director Art Stephenson, left, joins Jim Carter on stage for "It's a Safety Tradition."

Above, Elia Ordonez, center, and friends from left, Jose Matienzo, Luis Trevino, Pete Rodriguez, Norman Pabon-Medina, and Jiro Mendez, seated, appear as Carmen Miranda.

Cathy Fletcher, left, and Karen Surrett, right, do not "Sign, Seal and Deliver" a letter from Pam Cucarola.

Linder Metts, left, and Pat Fuller sing "Those Were the Days."

Paul Johnson, left, and Angela Lovelady share a retired moment.

All performers line up on stage for the finale.

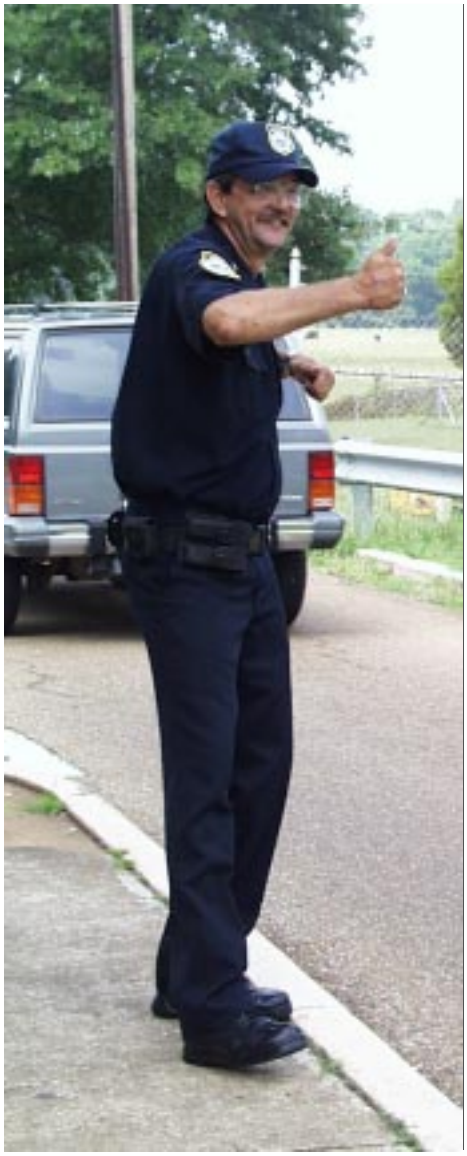


Photo by Sandy Riebeling, Redstone Rocket

Miller's exuberant wave through the guard gate has earned him a lot of early morning smiles from employees on Redstone Arsenal.

Redstone Arsenal gate guard keeps traffic moving with unique style

by Sandy Riebeling

It's all about attitude for Redstone civilian guard Tommy Miller, who does some fancy waving at the guard gates around the post.

"Everybody out here on the Arsenal thinks I'm crazy," Miller said, referring to his unusually high spirited wave through the security gates. "But that's OK. It feels good to make somebody smile. I don't care if they're laughing at me or with me, as long as it brings a smile to their face."

Miller, 47, has been a civilian guard at Redstone for 14 years, but his waves weren't always so enthusiastic.

"I used to come in to work just like some people I see driving through the gates with a long face. Sort of sorry they have to be here. Things changed two years ago, when my wife died," Miller said. "For a while I stood out here and cried. But then I realized, I'm still alive. I still get to get up and go to work every day. I'm still here. I used to have to come to work, now I get to. Realizing that made a big difference."

So Miller starts his shift at 5:30 every morning, filled with at least two cups of coffee and grateful to be surrounded by the natural wildlife at the Arsenal. He steps up to the curb bright eyed and ready with a smile and an energetic wave to usher in the thousands of people that pass through the gate.

He admits it's hard to "dance all day on concrete wearing rubber shoes." And sometimes his energy is drained, but he still does what he can to bring a smile to peoples' faces. Many stop and say hello and have come to expect his warm greeting in the mornings — no matter what the temperature outside.

It wasn't always like that, though. When Miller first made his change in attitude and style, not everyone liked it. Some encouraged him to be a bit more traditional. But Miller continued to embrace his new style, and eventually people began to enjoy his greeting. They called to tell his managers.

"I fear some people might have the perception that I'm not serious about my job. But they would be wrong," Miller said. "I take my job and the security of the Arsenal very seriously."

Miller spends much of his free time biking, swimming, fishing and walking. He's also a Tony Stewart NASCAR auto racing fan, and is anxiously awaiting the upcoming Alabama college football season.

Riebeling is a staff writer with the Redstone Rocket.

Marshall Retirees Association seeks members

The Marshall Retirees Association, now that it has withdrawn from the NASA Alumni League, is dedicated primarily to supporting Marshall and the NASA programs in North Alabama. A number of activities are planned, and under way, to accomplish this.

The association depends on its membership for the success of all activities. Membership is $30 annually. To join, complete the following information, and mail it to the address shown.

- Date of application
- Retirement date
- Your name: (Last, First, Middle, Nickname)
- Spouse's name: (First, Nickname)
- Address: (street, city, state, zip)
- Home phone
- Work phone
- Home e-mail
- Work e-mail
- Your signature

Include if payment of $30 is enclosed.

Send the information to Marshall Retirees Association, P. O. Box 4492, Huntsville, AL 35815.

Rideout Road construction should be complete by year's end

Marshall employees coming to work on Rideout Road may have noticed the construction crews located at Gate 9 and Toftoy Road.

According to Keith Cook, chief of the Construction Branch of Redstone Arsenal's Directorate of Public Works, the cinder block wall that is being built outside Gate 9 on Rideout Road will replace the old sign that said Redstone Arsenal. The new wall will include gates that can be closed when necessary.

The construction on Tolstoy Road is an upgrade to the bridge.

"We are replacing the bridge deck," Cook said. "The old bridge was 45 years old and could not be repaired. There also was damage to the steel support beams so those are being replaced."

Once the steel beams are in place, construction crews will build a tunnel passing underneath the work site so that traffic will not be affected once work begins to rebuild the bridge.

Both projects are expected to be completed in December.

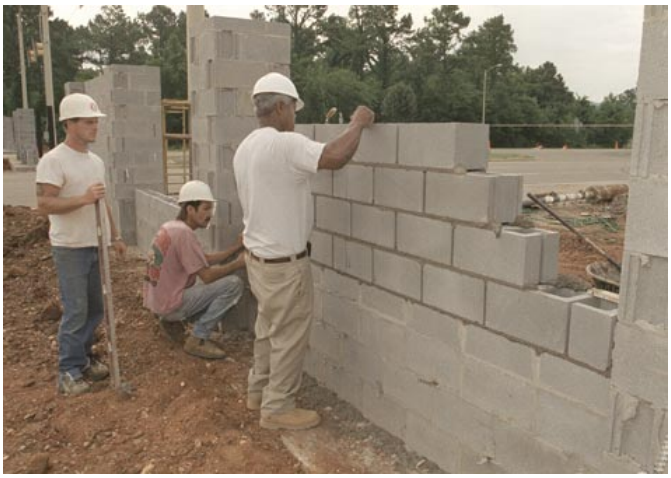


Photo by Terry Leibold, NASA/Marshall Space Flight Center

Just outside Gate 9 on Rideout Road, Marty Cain, left, Larry Speake, center, and David Swoope of Swoope Masonry, build the new sign to announce to visitors that they are entering Redstone Arsenal.

Photo by Dennis Olive, NASA/Marshall Space Flight Center

Henry Bryant, left, Roger Malone, center, and Chris Page, employed by Miller and Miller Contractors of Huntsville, renovate the 45-year-old Toftoy Road bridge that passes over Rideout Road.

New NASA technology

Video games may lead to better health

For decades, doctors have used biofeedback as a way to help control stress and tension. Now NASA technology adds a new twist by combining this mind-over-matter technique with the hand-eye coordination of video games.

This unique interactive system, tested at Eastern Virginia Medical School in Norfolk, trains people to change their brainwave activity or other physiological functions while playing popular off-the-shelf video games. This is accomplished by making the video game respond to the activity of the player's body and brain.

"Thirty years of biofeedback research has shown that by training specific brainwave changes, or reductions in other abnormal physiological signals, people can achieve a wide variety of health-enhancing outcomes," said Dr. Olafur Palsson, assistant professor of psychiatry and family medicine at Eastern Virginia Medical School. "With this new technology, we have found a way to package this training in an enjoyable and inherently motivating activity."

Signals from sensors attached to the player's head and body are fed through a signal-processing unit to a video game joystick or other control device. As the player's brainwaves come closer to an optimal, stress-free pattern, the video game's joystick becomes easier to control. This encourages the player to produce these patterns or signals to succeed at the game.

In this way, recreational video games have the potential to help both children and adults with a variety of health problems — from concentration difficulties to physical stress.

Unlike earlier biofeedback methods, which tended to be monotonous and simplistic, this technology adapts to today's most popular games, giving players a healthful side effect, while fully preserving the high-tech entertainment value.

"This technology is a spin-off of NASA research where we measure the brain activity of pilots in flight simulators," added co-inventor Dr. Alan Pope of Langley's Crew/Vehicle Integration Branch. "Flight simulators are essentially very sophisticated video games." Pope is an adjunct research assistant professor in psychiatry and behavioral sciences at Eastern Virginia Medical School.

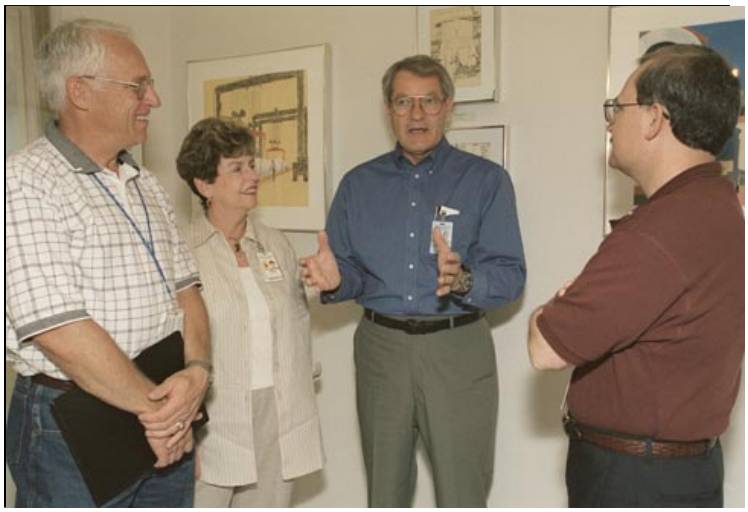


Photo by Doug Stoffer, NASA/Marshall Space Flight Center

History chats

Marshall retiree Ed Buckbee, second from right, former director of the U.S. Space & Rocket Center, chats with employees in Marshall's Heritage Gallery in Bldg. 4203 last Friday. Among the attendees are, from left, Bob Jaques, employed by Ai Signal Research Inc., an historian in the Internal Relations and Communications Department; Sandra Turner, Marshall's protocol officer; and John Dumoulin of the Media Relations Department. Robert Schwinghamer, retired as Marshall's associate director for technology, will speak at 11 a.m. Friday in the Heritage Gallery. The history chats are being held each week as part of Marshall's 40th anniversary celebration.

Marshall marks 40th anniversary

Center had key role in Spacelab management

This is the ninth in a series of historical articles the Marshall Star will publish this summer on the history of the Marshall Center.

by Mike Wright

As Space Shuttle development began at Marshall in the 1970s, planners at the Center were studying ways to use the proposed new vehicle's capabilities for scientific research. The ninth flight of the Shuttle carried a multiconfiguration spaceborne scientific laboratory called Spacelab into orbit.

Early studies at the Marshall Center had called for development of a versatile, reusable, laboratory facility. This facility would fit inside the payload bay of the Shuttle orbiter and provide scientists with workbench space, power, computer support and racks and storage for a scientist's own experiment equipment.

In 1970, the Marshall Center requested proposals from industry for the preliminary design of a research and applications module as a way to provide versatile laboratory facilities for Earth-orbital research and applications work. In 1971, the Marshall Center began in-house studies on a laboratory called the Sortie Can, later renamed the Sortie Lab. The Sortie concept for Spacelab included a combination of habitable modules in which scientists could conduct investigations, and unpressurized pallets for instruments requiring direct exposure to space.

In 1972, NASA began negotiations with the European Space Research Organization, the forerunner to the European Space Agency. This ultimately led to an agreement between NASA and the European Space Agency under which the European Space Agency assumed responsibility for funding, developing and building Spacelab.

Under the arrangement, Marshall did the feasibility and preliminary design work during the Sortie studies, and the European Space Agency did the engineering design and hardware development based on Marshall requirements.

Marshall, however, retained responsibility for technical and programmatic monitoring of Spacelab development activities in Europe, which involved 50 manufacturing firms in 10 European countries.

In addition to its program management responsibilities, Marshall was assigned responsibility for building related Spacelab flight components, including an optical window for scientific observations, and development of a pressurized transfer tunnel for passage of crew and equipment between the orbiter cabin and the laboratory module.

Marshall also had responsibility for Spacelab's command and data management subsystem and its high data rate multiplexer and high data rate recorder. In addition, a software development facility was established to develop and verify programs for the Spacelab experiment components. Other responsibilities ranged from the development of ground support equipment to sophisticated scientific instruments.

Spacelab also required engineers and other specialists at Marshall to perform systems analyses, design and develop integration hardware, oversee assembly and checkout, plan the flight timeline, conduct simulation and training exercises, and provide real-time support for the missions.

Marshall's payload crew training complex became a training site for Spacelab mission specialists from the scientific community. Prior to the establishment of a new Spacelab Mission Operations Control Center facility at Marshall, Marshall mission managers monitored, controlled and directed experiments aboard Spacelab from a Payload Operations Control Center at the Johnson Space Center.

The writer is the Marshall Center historian.

Local Boy Scouts earn Aviation Merit Badges with some help from Marshall, Bionetics

by Debra Valine

Marshall's chief engineer in the Space Shuttle Solid Rocket Booster Project Office and two employees of Bionetics of Huntsville helped a group of local Boy Scouts earn the Aviation Merit Badge.

Ten Boy Scouts in Madison's Troop 350 wanted to earn the badge, an optional Scouting badge not required for attaining the rank of Eagle, the Boy Scouts' highest honor.

Troop 350's Scoutmaster, John Chapman, is a 20-year veteran of the project office, and enjoys flying gliders as a hobby. Day-to-day, he is responsible for all the technical aspects of the Solid Rocket Booster.

In addition to classroom work on aircraft operations, aviation safety and careers in aviation, the Scouts had to select which two hands-on tasks to complete to earn the badge. One task selected was to plan a cross-country flight using aeronautical charts, and taking into account wind, magnetic compass effects and air speed of the plane. They also wanted to perform a pre-flight check of a general aviation aircraft.

Along with Chapman, Don Morison, aircraft mechanic and chief of quality control for Bionetics, the company that maintains and flies NASA's Gulfstream I aircraft, and Bionetics pilot John Stewart agreed to assist the Scouts.

Courtesy photo

Boy Scout Troop 350 on the steps of NASA's Gulfstream I aircraft.

"Morison set up a time on a Saturday morning at the Signature Hangar in Huntsville for the boys to go through a real pre-flight of an aircraft," Chapman said. "When we arrived, Morison and Stewart had clipboards for each boy with pre-flight checklists on them. They divided into two groups and proceeded to do an entire pre-flight with a NASA aircraft. It made quite an impression. The boys are still asking questions about the plane."

"I enjoy working with young people," Morison said. "And I like helping those with an interest in aviation. That early interest in aviation often leads to a career in the space program."

The writer, employed by ASRI, is the Marshall Star editor.

Chandra

Continued from page 1

Washington, D.C.

The Marshall Center manages the Chandra program for the Office of Space Science at NASA Headquarters. TRW Space and Electronics Group of Redondo Beach, Calif., is the prime contractor. Using glass purchased from Schott Glaswerke in Mainz, Germany, the telescope's mirrors were built by Raytheon Optical Systems Inc. of Danbury, Conn., coated by Optical Coating Laboratory Inc. of Santa Rosa, Calif., and assembled and inserted into the telescope portion of Chandra by Eastman Kodak Co. of Rochester, N.Y.

The scientific instruments were supplied by collaborations led by Pennsylvania State University at University Park; Smithsonian Astrophysical Observatory in Cambridge, Mass.; Massachusetts Institute of Technology in Cambridge, Mass.; and the Space Research Organization Netherlands, Utrecht.

The Smithsonian's Chandra X-ray Center controls science and operations from Cambridge, Mass. — working with astronomers around the globe to record the activities of the universe.

The writer, employed by ASRI, supports the Media Relations Department.

Employee Ads

Miscellaneous

★ New Jaffrey apple cider press, heavy duty, half bushel capacity w/filters, $325. 772-3400
★ Paraclipse antenna for satellite TV and other uses, 12', $1,000 obo; garden tiller, $150. 881-6040
★ Murray riding lawn mower, 40", 12HP, $300 obo. 895-09348
★ Jonseded electric chain saw, Model 2016, 16", new w/manual, $200. 772-3400
★ Room for rent, house located off South Memorial Parkway, Mt. Gap area, $325 per month plus half utilities ($50). 882-2645
★ Chocolate Lab puppies, 8-weeks old, excellent pedigree, sire DU model dog. 534-8176
★ Bedroom suite; queen bed, mattress, box springs, night stand, chest, dresser w/mirror, $325. 721-9749
★ Two 100 lb. propane cylinders w/regulator, $50 each. 233-1487
★ Beanie babies. 881-7000
★ Rug, Dhurrie, designed & made in India, 7'9"x9'8", light green w/green, white, cranberry flower design, rose border, $300. 722-9719
★ Two Seiberling I, P215/75R15M/S tires, whitewall, 45K miles tread. $45 883-5396
★ Guinea pig, short-haired, 10 months old, w/ cage and accessories, $20. 828-3887
★ Levolor mini-blinds, approx. 46"x58", six, $10 each, or all for $40. 851-9519
★ Flight equipment, 3 headsets, 2 portable intercoms, 2 PTT Yoke switches, $375. 232-1171
★ Child's Bauer impact ice hockey skates, size 12, new condition, $50. 533-5942
★ Canon computer printer, BH299m b/w, bath tub bench, tub safety handle, walker, walking canes. 534-4450
★ Labrador puppies, sire-AKC field champion, wormed and first shots, blacks and yellows, $350-$600. 882-2579 after 6 p.m.
★ Trailer, 4x8, black, standard tires, 2' high side boards, running lights, $250. 837-0559
★ Large pet carrier, $25. 882-3777
★ Heavy-duty Kitchen Aide washer, Sears dryer, sell as pair only, $150. 230-6846
★ Floral loveseat, $75; boy's 20", 5-speed bicycle, $60; boy's 16" bike, $30. 922-9387

Vehicles

★ 1989 Blazer, S-10, 165K miles, white, 2-door, V-6, air, automatic, moon roof, $2,350. 883-8947
★ 1972 GMC pickup truck, 350, V-8, PB/PS, air, $1,500. 881-9421
★ 1993 Dodge Grand Caravan SE, one owner, many new parts, service records available, $5,700. 895-9520
★ 1992 Buick Regal Custom, one owner, maroon, full power, 101K miles, $4,250. 534-4785
★ 1994 Acura Legend GS, 4-door, black w/tan leather, 80K miles, $16,500. 518-9788
★ 1999 Honda Accord EX, auto, 4-cylinder, 22K miles, black, extras, CD, moonroof, spoiler, $18,750. 309-0309
★ 1992 Acura Integra, red, 2-door hatchback, 5-speed, sunroof, a/c, pw, am/fm cassette, cruise, $5,400. 757-3320
★ 1994 Nissan Sentra, 96K miles, automatic, 4-door, am/fm tape, a/c, PW/PL, $3,750 obo. 464-0660
★ 1986 Mazda B200, 5-speed, long bed, one-owner, 183K miles, good tires, a/c is out, $1,500. 828-7452
★ 1994 Plymouth Voyager LE minivan, new transmission, new a/c, one owner, remote entry, 106K miles, $4,900. 883-8306

Free

★ Cat, neutered, declawed. 828-3887
★ Cat, gray tabby, male, very friendly, named "Tibbs." 895-9350 after 4:30 p.m.

Found

★ Men's dress tie, Bldg. 4200 area. Call 544-4758 to identify/claim

Wanted

★ Roommate to share expenses on 2-bedroom apartment in Madison. 971-0048.
★ Toddler bed using standard crib mattress. 881-3322
★ 2 to 4 tickets to any Alabama home football game. 10-40 yard line seats preferred. 881-3861

Carpool

★ Ride to work, 7 a.m.-3:30 p.m., Governors Drive/Huntsville Hospital area, will pay $6 per day. 534-5398

Center Announcements

☛ ***Shuttle Buddies* —** The Shuttle Buddies will meet for breakfast at 9 a.m. Aug. 28 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757 or Gail Wynn at 852-8189.
☛ ***Lunch Time Prayer* —** Lunch time prayer will be from noon-12:30 p.m. every Tuesday and Thursday in Bldg. 4200, room 432. For more information, call Johnnie Wilson at 544-1007 or send an e-mail to: johnnie.wilson@msfc.nasa.gov
☛ ***ASEM Meets* —** Managers and aspiring managers are invited to attend the American Society of Engineering Managers (ASEM) meeting at noon Aug. 29 at the Redstone Officers' and Civilians' Club. For membership and meeting information, call Pamela Takada at 544-3645.

Sports

***NASA Bowling League* —** The NASA Bowling League begins at 6 p.m. Sept. 5 at Monarch Lanes. All NASA employees, dependents and on-site contractor personnel may participate. For more information, call Chuck Seal at 544-1120 or Rob Lake at 544-1176.

***Rowing Club* —** The Rocket City Rowing Club's adult rowing clinic will be held from 5:30-7 p.m. Tuesdays, Sept. 5-Oct. 3. Learn basic rowing technique, along with equipment and basic lingo. Cost is $90. For more information, call Halley Little at (256) 539-8841.

***MARS Golf* —** A two-person best score tournament will be at 7:30 a.m., Sept. 16 at Point Mallard. Deadline to register is Sept. 8. For more information or to enter a tournament, call Lee Foster at 544-1589, Joey Butler at 544-3808 or Robert Rutherford at 544-8117.

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